

CLAIMS:

1. A system (200, 300, 400, 500, 600) for projecting an image on a display comprising:
 - a first dichroic means (212) receiving a first (204), a second (206) and a third (208) primary coloured light beam and adapted to transmit the first (204) and to reflect the second (206) and third (208) primary coloured light beams,
 - a second dichroic means (220) receiving said second (206) and third (208) primary coloured light beam and adapted to reflect said second (206) primary coloured light and to transmit said third (208) primary coloured light beam, characterized in further comprising:
 - a first polarizing means (216, 304) receiving said first primary coloured light beam (204), a second polarizing means (222, 404) receiving said second primary coloured light beam (206), and a third polarizing means (226, 602) receiving said third primary coloured light beam (208), which first, second and third polarizing means (216, 304, 222, 404, 226, 602) being adapted to transmit light polarized in a desired direction, and further comprising a reflective rotating means (210, 202) receiving reflected first, second and third primary coloured light beams (204, 206, 208) polarized in an undesired direction from at least one of said first, second and third polarizing means (216, 304, 222, 404, 226, 602) and adapted to convert said light polarized in said undesired direction to converted light polarized in said desired direction and reflect said converted light back to said first, second and third polarizing means (216, 304, 222, 404, 226, 602).
2. A system (200, 300, 400, 500, 600) according to claim 1 further comprising a first, second and third transmissive light valve means receiving said first, said second and said third primary coloured light beam (204, 206, 208), respectively, and each of said first, second and third transmissive light valve means being adapted to modulate one of said first, said second and said third primary coloured light beams (204, 206, 208).
3. A system (200, 300, 400, 500, 600) according to claim 2, further comprising a recombination prism (218) receiving modulated first, second and third primary coloured light

from said first, second and third transmissive light valve means, and being adapted to recombine said modulated first, second and third primary coloured light beams into said image to be projected on said display.

5 4. A system (200, 300, 400, 500, 600) according to claim 1, wherein said first, said second and said third primary coloured light beam (204, 206, 208) are coloured blue, green and red, respectively.

10 5. A system (200, 300, 400, 500, 600) according to claim 1, wherein said reflective rotating means (202, 210) comprises a quarter wave plate (210) adapted to receive said reflected first, second and third primary coloured light beams (204, 206, 208) polarized in said undesired direction and to rotate polarization of said reflected first, second and third primary coloured light beams (204, 206, 208) by 90°, and a patterned mirror (202) having reflective regions adapted to reflect rotated reflected first, second and third primary coloured
15 light beams (204, 206, 208) received from said quarter wave plate (210) back through said quarter wave plate (210) thereby establishing a rotation of polarization of reflected first, second and third primary coloured light beams (204, 206, 208) to a desired direction.

20 6. A system (200, 300, 400, 500, 600) according to claim 5, wherein said patterned mirror (20) comprises transparent regions adapted to transmit said first, second and third primary coloured light beams (204, 206, 208) polarized in said desired and said undesired direction from a light source to said quarter wave plate (210).

25 7. A system (300, 400, 500, 600) according to claim 1, wherein said first dichroic means (212) is operable as a low pass filter having a threshold for p-polarized light at the upper spectral limit of the spectral range of said first primary coloured light beam (204).

30 8. A system (300) according to claim 1, wherein said second dichroic means (220) is operable as a high pass filter having a threshold for p-polarized light at the upper spectral limit of the spectral range of the second primary coloured light beam (206).

9. A system (300, 400, 500, 600) according to any of claims 7 to 8, wherein said first polarizing means comprising a first polarizer (304) and said second and third polarizing means comprising a reflective polarizer (226, 222).

10. A system (400, 600) according to claim 1, wherein said second dichroic means (220) is operable as a notch filter having a lower threshold for s-polarized light of the lower spectral limit of the spectral range of said second primary coloured light beam (206) and an upper threshold for s-polarized light at the upper spectral limit of the spectral range of said second primary coloured light beam (206).
11. A system (400,600) according to claim 10, wherein said first polarizing means comprising a first polarizer (304), said second polarizing means comprising a second polarizer (404), and said third polarizing means comprising a reflective polarizer (226).
12. A system (400) according to claim 11 further comprising a third dichroic means (406) operable as a high pass filter having a threshold equal to lower spectral limit of the spectral range of said second primary coloured light beam (206).
13. A system (600) according to claim 11 further comprising a third dichroic means (604) operable as a low pass filter having a threshold for s-polarized light at the lower spectral limit of the spectral range of said third primary coloured light (208).
14. A system (600) according to claim 13, wherein said low pass filter having a threshold for p-polarized light above the spectral limit of the spectral range of said third primary coloured light (208).
15. A system (600) according to any of claims 13 to 14 further comprising a white mirror (606) for reflecting s-polarized light in the spectral range of said first primary coloured light beam (204), p-polarized light in the spectral ranges of said second and third primary coloured light beams (206, 208).
16. A system (500) according to claim 1, wherein said second dichroic means (220) is operable as a high pass filter having a threshold for s-polarized light at the upper spectral limit of the spectral range of said second primary coloured light beam (206).

17. A system (500) according to claim 16, wherein said first polarizing means comprising a first polarizer (304), said second polarizing means comprising a second polarizer (404), and said third polarizing means comprising a reflective polarizer (226).
- 5 18. A system (500) according to claim 17 further comprising a third dichroic means (502) operable as a high pass filter having a threshold for s-polarized light at the upper spectral limit of the spectral range of the second primary coloured light beam (206).
19. A system (200) according to claim 2, wherein said second polarizing means
10 (222) is adapted to rotate so as to control amount of said second primary coloured light beam (206) reaches said second light valve means.
20. A system (200) according to claim 2, wherein said second polarizing means (222) comprises a normal polarizer.